

Phaeophyta, comprising from about 20% to 97%, by weight, of said composition.

2. One or more plant materials selected from the plant families *Gossypium* and *Cannabacea*, comprising from about 3% to 80%, by weight, of said composition.
25. A chemical composition in accordance with Claim 24, further comprising an ammonium-free source of inorganic nitrogen from about 0.5% to 7.5%, by weight, of the composition whereby said ammonium-free source of inorganic nitrogen comprises one or more selected from the group consisting of sodium nitrate, sodium-potassium nitrate, and potassium nitrate.
26. A chemical composition in accordance with Claim 24, further comprising a source of complex, biologically hydrolyzable nutrient phosphorus from about 0.25% to 15%, by weight, of said composition whereby said source of complex, biologically hydrolyzable nutrient phosphorus comprises one or more selected from the group consisting of ringed metaphosphates and linear polyphosphates.
27. A chemical composition in accordance with Claim 24, whereby said source of complex, biologically hydrolyzable nutrient phosphorus comprises one or more further selected from the group consisting of sodium hexametaphosphate, sodium trimetaphosphate, sodium tripolyphosphate, sodium-potassium tripolyphosphate, and tetrasodium pyrophosphate.
28. A chemical composition in accordance with Claim 24, further comprising a source of chelating agents from about 0.01% to 5%, by weight, of said composition whereby said chelating agents comprise one or more selected from the group consisting of citric acid, humic acid, fulvic acid, sodium citrate, nitrilotriacetic acid (NTA), and ethylenediaminetetraacetic acid (EDTA).
29. A chemical composition in accordance with Claim 24, further comprising inoculum for one or more microorganisms, from about 0.001% to 2%, by weight, of said composition whereby said microorganisms are selected from the group consisting of soil bacteria, metal-reducing bacteria, legume-related bacteria, plant-fiber degrading bacteria and plant-fiber degrading fungi.
30. A chemical composition in accordance with Claim 24, further comprising one or more

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plant materials from about 0.5% to 30%, by weight, of said composition selected from the group consisting of the families *Triticum* and *Aegilops*.

31. A chemical composition in accordance with Claim 24, whereby said plant materials from the plant family *Leguminosae* comprise one or more further selected from the group consisting of *Lespedeza* spp., *Medicago* spp., *Vicia* spp., *Glycine* spp., *Lathyrus* spp. and *Trifolium* spp.
32. A chemical composition in accordance with Claim 24, whereby said plant materials from the plant family *Phaeophyta* comprise one or more further selected from the group consisting of *Sargassum* spp.
33. A chemical composition in accordance with Claim 24, whereby said plant materials from the plant family *Gossypium* are one or more further selected from the group consisting of cotton lint and other fibrous cotton-containing materials produced by the cultivation or processing of cotton, cotton plants and cotton seed.
34. A chemical composition in accordance with Claim 24, whereby said plant materials from the plant family *Cannabaceae* are one or more further selected from the group consisting of plant materials from hemp or hops plants.
35. A chemical composition in accordance with Claim 29, whereby said inoculum for microorganisms comprise one or more further selected from the group consisting of "yellow boy" and other biogeochemically produced ferric oxides, hydroxides and oxyhydroxides produced from acid-mine drainage wastes or the treatment thereof.
36. A chemical composition in accordance with Claim 29, whereby said microorganisms comprise one or more further selected from the group consisting of *Rhizobium* spp., *Bradyrhizobium* spp., *Fibrobacter* spp., *Clostridium* spp. *Pseudomonas* spp., *Geobacter* spp. and *Thiobacillus* spp.
37. A chemical composition in accordance with Claim 30, whereby said plant materials are one or more selected from the group consisting of wheat, oats, barley, and rye.

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38. A chemical composition in accordance with Claim 24, whereby the forms of said plant materials are one or more selected from the group consisting of powders, flours, pellets, meals, mids, husks, hulls, hays and straws.
 39. A chemical composition in accordance with Claim 30, whereby the forms of said plant materials are one or more selected from the group consisting of powders, flours, pellets, meals, mids, husks, hulls, hays and straws.
 40. A chemical composition in accordance with Claim 31, whereby the forms of said plant materials are one or more selected from the group consisting of powders, flours, pellets, meals, mids, husks, hulls, hays and straws.
 41. A chemical composition in accordance with Claim 32, whereby the forms of said plant materials are one or more selected from the group consisting of powders, flours, pellets, meals, mids, husks, hulls, hays and straws.
 42. A chemical composition in accordance with Claim 33, whereby the forms of said plant materials are one or more selected from the group consisting of powders, flours, pellets, meals, mids, husks, hulls, hays and straws.
 43. A chemical composition in accordance with Claim 34, whereby the forms of said plant materials are one or more selected from the group consisting of powders, flours, pellets, meals, mids, husks, hulls, hays and straws.
 44. A chemical composition in accordance with Claim 24, whereby said composition is prepared as one or more forms selected from the group consisting of granules, briquettes, pellets, tablets, and capsules.
 45. A chemical composition in accordance with Claim 25, whereby the said composition is prepared as one or more forms selected from the group consisting of granules, briquettes, pellets, tablets, and capsules.
 46. A chemical composition in accordance with Claim 26, whereby said composition is prepared as one or more forms selected from the group consisting of granules, briquettes,

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47. A chemical composition in accordance with Claim 27, whereby said composition is prepared as one or more forms selected from the group consisting of granules, briquettes, pellets, tablets, and capsules.
48. A chemical composition in accordance with Claim 28, whereby said composition is prepared as one or more forms selected from the group consisting of granules, briquettes, pellets, tablets, and capsules.
49. A chemical composition in accordance with Claim 29, whereby said composition is prepared as one or more forms selected from the group consisting of granules, briquettes, pellets, tablets, and capsules.
50. A chemical composition in accordance with Claim 30, whereby said composition is prepared as one or more forms selected from the group consisting of granules, briquettes, pellets, tablets, and capsules.
51. A chemical composition in accordance with Claim 31, whereby said composition is prepared as one or more forms selected from the group consisting of granules, briquettes, pellets, tablets, and capsules.
52. A chemical composition in accordance with Claim 32, whereby said composition is prepared as one or more forms selected from the group consisting of granules, briquettes, pellets, tablets, and capsules.
53. A chemical composition in accordance with Claim 33, whereby said composition is prepared as one or more forms selected from the group consisting of granules, briquettes, pellets, tablets, and capsules.
54. A chemical composition in accordance with Claim 34, whereby said composition is prepared as one or more forms selected from the group consisting of granules, briquettes, pellets, tablets, and capsules.

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55. A chemical composition in accordance with Claim 35, whereby said composition is prepared as one or more forms selected from the group consisting of granules, briquettes, pellets, tablets, and capsules.
56. A chemical composition in accordance with Claim 36, whereby said composition is prepared as one or more forms selected from the group consisting of granules, briquettes, pellets, tablets, and capsules.
57. A chemical composition in accordance with Claim 37, whereby said composition is prepared as one or more forms selected from the group consisting of granules, briquettes, pellets, tablets, and capsules.
58. A chemical composition in accordance with Claim 38, whereby said composition is prepared as one or more forms selected from the group consisting of granules, briquettes, pellets, tablets, and capsules.
59. A chemical composition in accordance with Claim 39, whereby said composition is prepared as one or more forms selected from the group consisting of granules, briquettes, pellets, tablets, and capsules.
60. A chemical composition in accordance with Claim 40, whereby said composition is prepared as one or more forms selected from the group consisting of granules, briquettes, pellets, tablets, and capsules.
61. A chemical composition in accordance with Claim 41, whereby said composition is prepared as one or more forms selected from the group consisting of granules, briquettes, pellets, tablets, and capsules.
62. A chemical composition in accordance with Claim 42, whereby said composition is prepared as one or more forms selected from the group consisting of granules, briquettes, pellets, tablets, and capsules.
63. A chemical composition in accordance with Claim 43, whereby said composition is prepared as one or more forms selected from the group consisting of granules, briquettes,

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pellets, tablets, and capsules.

64. A chemical composition in accordance with Claim 24, whereby the forms of said plant materials comprise one or more selected from the group consisting of dehydrated, dried and freeze-dried forms.
65. A chemical composition in accordance with Claim 29, whereby the forms of said inoculum for microorganisms comprise one or more selected from the group consisting of dehydrated, dried and freeze-dried forms.
66. A chemical composition in accordance with Claim 24, further comprising a binding agent from about 0.1% to 7%, by weight, of said composition.
67. A chemical composition in accordance with Claim 66, whereby said binding agent comprises one or more selected from the group consisting of pre-gelled starch, starch, molasses, barley malt extract, corn syrup, vegetable oils, vegetable fats, animal oils, animal fats, animal lards, glycerin, gelatine, bentonite, montmorillonite, kaolinite, and calcium carbonate.
68. A chemical composition in accordance with Claim 24, whereby said plant materials are cultivated *in-situ* within contaminated environmental media.
69. A chemical composition in accordance with Claim 30, whereby said plant materials are cultivated *in-situ* within contaminated environmental media.
70. A chemical composition in accordance with Claim 31, whereby said plant materials are cultivated *in-situ* within contaminated environmental media.
71. A chemical composition in accordance with Claim 32, whereby said plant materials are cultivated *in-situ* within contaminated environmental media.
72. A chemical composition in accordance with Claim 33, whereby said plant materials are cultivated *in-situ* within contaminated environmental media.